



CFLHD CADD Standards Manual

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This document has been prepared for:

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Software Versions

MicroStation J version 07.01.04.10

GEOPAK 2001 MR, Build 29



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Chapter 1 Introduction

Purpose

This document is intended to outline the Federal Highway Administration's Central Federal Lands Highway Division's (CFLHD) use of Bentley's MicroStation and GEOPAK, as well as internally developed tools and procedures. The CADD (Computer Aided Design and Drafting) Standards Manual will address issues such as; software, tools, techniques, standards, and procedures, which will aid the user in the efficient production of PS&E plans.

The CADD Standards Manual and the associated electronic files are to be used in the generation of electronic plans by both CFLHD internal designers and the A/E firms doing business with CFLHD.

The proper use of CADD Standards can produce many desirable results, including:

- Increased efficiency and productivity
- Re-usability of data
- Increased ability to share resources

The CADD Standards Manual is intended to be as all encompassing as possible. However, there will be circumstances, such as with various scales of drawings, where there is no one correct answer. In these cases the engineer or designer must use his or her judgment to stay as close to the original intent of this manual as possible.

Outline of Manual

The CADD Standards Manual covers the use of both MicroStation and GEOPAK. The first section of Chapters cover the use of MicroStation, including topics such as:

- Directory structures
- File naming conventions and locations
- Seed files
- Annotation
- Line styles
- Color Table
- Cell libraries
- Levels and Symbolology
- Plotting
- CFLHD Macro's

The second section of Chapters cover the use of GEOPAK, including topics such as:

- User Preferences
- Project Manager
- DTM creation
- Design and Computation Manager
- Horizontal and Vertical Design

- Cross-Sections
- Quantities
- Cut Sheets
- Reports
- File exchange procedures
- Miscellaneous

Conventions

The CADD Standards Manual contains special features designed to help the users find information quickly and easily. Below is a description of the conventions used throughout this manual.

Use of Bold and (>) Greater-Than Symbol

Bold letters are used to identify program commands, menus, and file names. The greater-than symbol (>) is used to divide a series of commands.

For example:

Open the file **TTL.dgn** using the **File>Open** command. If it is not in the expected folder, click the **Cancel** button.



Caution is to be shown when the reader should take particular note of the information being discussed.



Information is used to provide helpful information about a particular item when it is being discussed, or to provide general information about the standards as needed.

Hyperlinking

Throughout the manual there will be references to information found on the CFLHD website, along with the accompanying web link to this information. Links will be in blue, as shown below:

<http://www.cflhd.gov/>

Terms and Abbreviations

Abbreviation	Description
CADD	Computer Aided Drafting and Design
CFLHD	Central Federal Lands Highway Division
Excel	Spreadsheet software from Microsoft
FHWA	Federal Highway Administration
GEOPAK	Civil Engineering highway Design Software from Bentley Systems, Inc.
MicroStation	Drafting Software from Bentley Systems, Inc.
MU	Master Units, part of MicroStation's unit system
PS&E	Plans, Specifications, & Estimates
PU	Positional Units, part of MicroStation's unit system
Symbology	Color, weight, and style of graphical elements
SU	Sub-units, part of MicroStation's unit system
UOR	Units of Resolution
WYSIWYG	What You See Is What You Get

Standard File Extensions

Extension	Description
.DGN	MicroStation graphics design file
.DWG	AutoCAD graphics drawing file
.LVL	MicroStation level structure support file
.DDB	GEOPAK D&C Manager database file
.RSC	MicroStation resource file
.X08, .X10	GEOPAK Criteria files
.CON	2D MicroStation design file containing contours
.MAP	2D MicroStation design file containing mapping planimetrics
.DTM	MicroStation design file containing 3D graphics used to create GEOPAK .TIN file
.TIN	GEOPAK digital terrain model
.RWP	MicroStation design file containing right of way plans
.UTL	2D MicroStation design file containing utilities
.GPK	GEOPAK coordinate geometry database
.NEZ	Final ASCII control file



Support

CADD Support help using this manual, comments, and suggestions for these CADD standards should be addressed to:

<mailto:caddstandard@fhwa.dot.gov>